Correspondence

The Editors will be pleased to receive and consider for publication correspondence containing information of interest to physicians or commenting on issues of the day. Letters ordinarily should not exceed 500 words and must be typewritten, double-spaced, and submitted in duplicate (the original typescript and one copy). Authors will be given the opportunity to review the editing of their correspondence before publication.

Organic Cognitive Impairment?

To THE EDITOR: An epidemic of local and systemic symptoms that followed the introduction of heat-cured phenol-formaldehyde resin in an aerospace plant generated public and professional disagreements over the cause of the outbreak.[1] Even though previous psychiatric evaluations were reported to have identified "brain damage," Sparks and colleagues have rejected the suggestion of organic brain effects among affected workers based on their use of an insensitive neuropsychological assessment of cognitive functions, and they have failed to present the data from those referred for the "standard battery of neuropsychological tests." In contrast to the thoroughness with which workers were screened for psychiatric diagnoses, screening for organic cognitive impairment was limited to "Folstein's Mini-Mental State examination, a brief test of cognitive ability,"[1] which has been criticized as "insensitive" because of "high false-negative rates" from "the reliance . . . on a global estimate of cognitive status (which) obscures the presence of isolated . . . deficits."[2] Since the usual pattern of cognitive function in mild chronic toxic encephalopathy is measurable impairment of only one or several specific types of cognition, use of a screening or diagnostic method that does not recognize such limited impairment would certainly mean that recognizable cases would be misclassified. Even with a relatively insensitive screening tool, Sparks and co-workers identified 4 persons with scores that indicated cognitive impairment. When these 4 and 21 others with symptoms of cognitive impairment were referred for detailed neuropsychological testing, however, "none were reported to have significant cognitive deficits of recent onset." This sequence is sufficiently unexpected that a more detailed presentation of data would have been in order. When their insensitive screening method produced positive results that were uniformly false, then the method in their hands did not have the "excellent reliability and validity" that they claimed. Their hypothesis that all cases were of psychosocial origin did not explain their four cases that were screened out as having cognitive impairment.

A reasonable alternative hypothesis could be that susceptible workers could have had mild organic cognitive impairment from which some could have recovered over periods of 4 to 12 months or more. Thus, examinations while the exposures were recent could have validly identified cognitive impairment, while a screening procedure done 6 to 12 months later could have shown that many no longer had cognitive impairment, and referral tests done an additional 1 to 3 months later could have shown that all tested had recovered, if such were the case. In this scenario no one would have to be accused of being wrong, but one would have to acknowledge that the final referral neuropsychological tests did not exclude organic cognitive impairment in the symptomatic period during and immediately after the exposures.

The authors claimed an absence of evidence for neurotoxicity of low-level formaldehyde exposure, which is contradicted by Kilburn and colleagues[3] and by Russian experience cited by Anger and Johnson.[4] Phenol is also neurotoxic.[4,5] Formaldehyde and phenol could have a synergistic neurotoxic effect.

We believe we have encountered cases of neurotoxic effects of phenol-formaldehyde resins in a different setting. We have seen fewer and more sporadic cases with unprotected exposures in poorly ventilated plywood or particleboard mills, usually resulting from periods of exposure of at least several years.[6] Our cases involved more men than women and produced objective effects on both central and peripheral nervous systems. Similar neurotoxic effects of phenol-formaldehyde resin have been reported from Russia[7] and Egypt.[8] We believe that Sparks and colleagues relied on an uncertain neuropsychological screening process, failed to consider the possible favorable prognosis of very mild cognitive impairment, and have underestimated the neurotoxicity of formaldehyde and phenol.

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Dr Sparks Responds

To THE EDITOR: I appreciate the thoughts of Morton and Feldstein regarding our previous article on an outbreak of illness in aerospace workers.[1] I agree that Folstein's screen of cognitive function is relatively insensitive.[2] Of those who demonstrated abnormalities on the Mini-Mental State Examination, noncooperation, preexisting learning disabilities, or inattention due to depression could not be specifically addressed, as may be possible with a more detailed battery of tests combined with old school records or other data on baseline cognitive function.

We chose not to go into detail on the methodology and results of the more extensive neuropsychological testing done on a large proportion of the workers in our study, as we anticipate that this will be described in a future publication by the examining neuropsychologist.

The problems of population selection, methodology, and interpretation associated with Kilburn's study of histology technicians have been reviewed in several publications.[3,4] Also, neurotoxic effects of volatile organic compounds such as phenol are dependent on dose,[5] which in the case of the outbreak described in our paper was relatively low.

Much of the interpretation of the results of neuropsychological testing appears in the realm of art rather than science,[6] and the debate about whether subtle cognitive changes, temporary or persistent, may exist in workers with low-level exposure to phenol or other solvents will likely rage for years to come.

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On-Line Medical Command

To THE EDITOR: We are pleased to note that Hoffman and colleagues[1] have joined us in suggesting that paramedics should be allowed to exercise discretion in the use of on-line medical command (base command contact). Through review of cases comprising 28.4% of all contacts at their hospital, they determined that just 13 of 659 patients received "unanticipated therapies."

We analyzed 7,862 prehospital cases involving advanced life support of which 5,533 received on-line medical command; the remaining 2,329 cases were managed by protocol alone. For the 5,075 cases involving on-line medical command with no missing data, there were 176 occasions in which base command physicians deviated from standard treatment protocols.[2]

Our data reveal that of 2,232 cardiac cases that included lethal and nonlethal dysrhythmias, congestive heart failure, and chest pain of presumed cardiac origin, deviation from standard treatment protocols occurred on 121 occasions. Medical cases including seizure, syncope, abdominal pain, and altered mental status comprised 2,605 cases with physician-ordered deviation from protocol on 52 occasions. Trauma patients made up our smallest group—most of these patients did not receive on-line medical command—and of the 238 patients managed with on-line medical command, protocol deviations were ordered by physicians for only 3. In our study, physician discretion and resulting deviation from standard treatment protocols were more likely to occur among cardiac patients (121 of 176) than among those with complaints similar to the group studied by Hoffman (52 of 176).

Based on our experience we suspect that the sampling methodology used by Hoffman and colleagues leads them to overestimate unnecessary base command contacts at 90%. We estimate that an 80% reduction in calls may be possible.

Hoffman and associates estimate that reduced numbers of base command contacts could result in a cost reduction of $3 million out of a $7 million budget in Los Angeles. While that may be so in Los Angeles with its plethora of base command facilities, other systems with fewer base facilities would not achieve as great a cost reduction. Hoffman and colleagues' estimate is made without consideration for additional costs resulting from changing the system or the potential adverse effects of a discretionary system. Paramedics may not call when they should or they may reduce compliance with standard treatment protocols because they would be supervised less. To counter these potential effects, a retrospective medical control system that reliably measures paramedics' adherence to protocols and the effectiveness of their discretion in selecting those cases that require on-line medical command must be in place. Additional field supervision and training may be required. These are costly activities and would need to be included in the total costs of medical control, thus tending to reduce the economic savings from the reduction in use of on-line medical command.

Hoffman and co-workers' report contributes to the body of work that calls into question the efficiency and efficacy of mandatory use of on-line medical command. We agree that the efficiency and efficacy of its routine use must be evaluated rather than simply accepted as a routine practice. It seems to us that the accumulated evidence lays the foundation for a controlled study that will compare the cost benefits from a system with paramedic discretion to a compulsory system of on-line medical command.

Hoffman's paper was presented at the annual meeting of the Society of Academic Emergency Medicine (previously University Association for Emergency Medicine) in Minneapolis, Minnesota, during the May 1990 meeting, not 1989 as printed.

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Drs Hoffman and Schriger Respond

To THE EDITOR: We are substantially in agreement with Davidson and Erder, whose data are basically concordant with our own. Given the experimental error inherent in any estimation of proportions based on a single group of subjects, we think their estimated reduction of 80% in unnecessary base command contacts only serves to support our own esti-